

PDNO: 10030377-1
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Conf. No. 8105

NOV 22 2006

REMARKS

Claims 2-11, 13-15, and 17-20 are pending in this application. Claims 2-11, 13-15, and 17-19 stand rejected as being unpatentable under 35 U.S.C. § 103 over previously cited U.S. Patent No. 5,583,468 by Kielmeyer et al. (hereinafter "Kielmeyer") in view of newly cited U.S. Patent No. 6,908,843 by Baldonado et al. (hereinafter "Baldonado"). Claim 20 stands rejected as being unpatentable over Kielmeyer in view of Baldonado in further view of previously cited U.S. Patent No. 6,548,893 B1 by Chen et al. (hereinafter "Chen").

Rejections Under 35 U.S.C. § 103

Claims 2-11, 13-15, and 17-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kielmeyer in view of Baldonado. The Examiner acknowledges that "Kielmeyer does not specifically state that the first bond includes a ball bond and an intermediate bond being closer to the first edge than the ball bond [claim 5]." Referring to figures 1 and 4 of Kielmeyer, it is seen that no intermediate bond is disclosed. The Examiner asserts that "it is well known in the art to include an intermediate (stitch) bond and a ball bond when wire bonding to a conductor when the intermediate bond is closer to the first edge than the ball bond as evidenced by Baldonado (col. 2, lines 45-60)." The Examiner further asserts that "it would have been obvious . . . to include an intermediate (stitch) bond and ball bond in the first bond in the invention of Kielmeyer . . . as evidenced by Baldonado . . . to reduce the risk of wire spacing violations and unwanted shorting" (Baldonado col. 2, lines 45-60). The Applicants respectfully traverse.

Each reference must be taken as a whole, including where the references diverge and teach away from the claimed invention (*In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992)). Claim 5 must also be considered as a whole (*Id.*). "[C]laim language is analyzed, not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art." *In re Moore*, 439 F.2d 1232, 169 USPQ 236 (C.C.P.A. 1971); *In re Angstadt*, 537 F.2d 498, 190 USPQ 214, 217 (C.C.P.A. 1976). The Examiner must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims (*Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir.) (en banc), aff'd, 116 S. Ct. 1384 (1996)) (see also, *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc)). All words in a claim must be considered in judging

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the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 165 USPQ 494, 496 (C.C.P.A. 1970).

Claim 5 recites: "An electrical interconnection comprising:

a first planar transmission device having a first conductive region with a first edge;

a second planar transmission device having a second conductive region with a second edge, the second edge being offset from the first edge; and

a bond wire coupled to the first edge with a first bond and to the second edge with a second bond,

wherein the first bond includes a ball bond and an intermediate bond, the intermediate bond being closer to the first edge than the ball bond."

To establish a *prima facie* case of obviousness the prior art references must teach or suggest all the claim limitations. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In Fig. 2, below, Baldonado shows a ball bond 12 attaching a bond wire 20 to a semiconductor die 10. The opposite end of the bond wire 20 is terminated at an interposer pad 21, and a second ball bond 23 attaches a second bond wire 24 to the interposer pad 21. The second bond wire 24 is terminated at a lead 26 (see also, Baldonado, Fig. 5 for a plan view) (The undersigned notes that Baldonado refers to element 25 both as a "lead" (col. 2, line 47) and as a "stitch" (col. 2, line 28)).

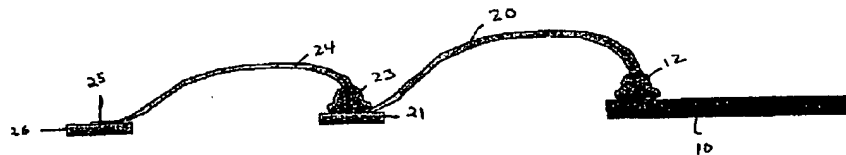


Fig. 2, Baldonado

Baldonado does not teach or suggest a bond wire coupled to a first edge of a device with a first bond including a ball bond and an intermediate bond. Baldonado shows two bond wires 20, 24, not a first bond including a ball bond and an intermediate bond. The interposer pad 21, and hence the tail of bond wire 20, is further away from the edge of the

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semiconductor die 10 than is the ball bond 12 (see also, page 7 of the Office action, where the Examiner refers to Fig. 4 of Kielmeyer, ref. num. 47 as an edge). The references do not teach or suggest all elements of claim 5. The Examiner has not established a *prima facie* case of obviousness against claim 5. Claim 5 and all claims that depend from claim 5 are allowable.

To establish a *prima facie* case of obviousness there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Examiner asserts that one would have been motivated to modify the microcircuit assembly of Kielmeyer "to include an intermediate (stitch) bond and a ball bond . . . as evidenced by Baldonado (col. 2, lines 45-60) . . . to reduce the risk of wire spacing violations and unwanted shorting". Baldonado states that "bonding wire lengths of less than approximately 4 mm to maintain wire spacing and reduce wire shorts during encapsulation" (col. 2, lines 11-13). Baldonado discloses that using the interposer pad and two bond wires 20, 24 reduces wire sweep, which decreases the risk of wire spacing violations and thus wire shorts (col. 2, lines 54-56). Kielmeyer does not disclose or suggest encapsulating the microcircuit module. The Examiner has not provided a convincing line of reasoning as to why one would want to encapsulate the microcircuit module. Wire sweep, and the attendant wire spacing violations and wire shorts, would not arise in a modified device of Kielmeyer because it would not be encapsulated.

Furthermore, Kielmeyer states that "[a]t higher frequencies, the bondwire inductive reactances, become excessively high. Impedance mismatch due to high inductive reactances cause signal reflections which degrade microwave performance" (col. 1, lines 54-57). One of ordinary skill in the art, considering Kielmeyer as a whole, would have been led to keep the bond wires 36, 37, 38, 39 short in order to avoid unduly degrading microwave performance (see also, Kielmeyer, col. 7, lines 56-60). The asserted motivation fails because a "risk of wire spacing violations and unwanted shorting" would not occur in the device of Kielmeyer.

Kielmeyer states that "[t]he connections of bondwires 38 and 39 to first and second edges 47 and 48 are to be made as closely as assembly techniques allow to the outside lengthwise edges of first substrate end 30 to minimize the reactance associated with the connection and minimize reflective loss" (col. 7, lines 56-60). This teaches away from the

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urged modification and teaches away from claim 1 because placing the single bondwire connections as close to the edge as possible precludes "the intermediate bond being closer to the first edge than the ball bond" recited in claim 5. Claim 5 and all claims that depend from claim 5 are patentable. Claim 17 and all claims that depend from claim 17 are also patentable for at least similar reasons.

Claim 6, which depends from claim 5 through claim 2, further recites that "the third bond includes a second ball bond and a second intermediate bond, the first ball bond being closer to an end of the first center conductor than the second ball bond." Kielmeyer states that "[t]he connections of bondwires 38 and 39 to first and second edges 47 and 48 are to be made as closely as assembly techniques allow to the outside lengthwise edges of first substrate end 30 to minimize the reactance associated with the connection and minimize reflective loss" (col. 7, lines 56-60). Kielmeyer makes similar remarks about the other bond wire connections. Kielmeyer teaches away from claim 6 because if all bondwire connections are made as close to the edge as assembly techniques allow, then the first ball bond would not be closer to the end of a center conductor than the second ball bond, they both would be equally close to the edge, namely, "as closely as assembly techniques allow" (see, Kielmeyer, Figs. 1, 4, and 5, note Fig. 4, ref. nums. 47, 48 and Fig. 5, ref. nums. 49, 50 (providing bonding areas sufficiently wide to allow side-by-side ball bonding)). The references cited by the Examiner do not disclose or suggest all elements of claim 6. Kielmeyer teaches away from claim 6. The motivation asserted by the Examiner in rejecting claim 6 fails for at least the reasons given above in support of claim 5. Claim 6 is further patentable.

Claim 7, which depends from claim 5 through claims 6 and 2, further recites that "the first center conductor has a width less than or equal to twice a bond target width." Kielmeyer teaches away from claim 7 by providing wide bonding areas that allow side-by-side ball bonding (see, e.g., Fig. 4, ref. num. 44; Fig. 5, ref. nums. 49, 50). To establish a *prima facie* case of obviousness, the reference teachings must be taken as a whole, including where they teach away from the claim, and must "appear to have suggested the claimed subject matter." *In re Rinehart*, 531, F.2d 1048, 189 USPQ 143, 147 (C.C.P.A. 1976). Considering claim 7 and the claims from which it depends as a whole, the references cited by the Examiner do not do this. Kielmeyer, considered as a whole, teaches away from claim 7 by providing wide bonding areas, and claim 7 is further

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patentable. Amended claim 18, which depends from amended claim 17, is further patentable for at least similar reasons.

37 C.F.R. § 1.104(c) states that "In rejecting claims for . . . obviousness, the examiner must cite the best references at his or her command. When a reference . . . shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable." The Examiner has not identified where Kielmeyer discloses that "the first planar transmission device is a first microstrip transmission line and the second planar transmission device is a second microstrip transmission line [claim 8], wherein in the first planar transmission device is a first slot line and the second planar transmission device is a second slot line [claim 10]" (Detailed Action, page 4, line 20-page 5, line 1). The undersigned notes that the "mode converter 16 is formed by hybrid coplanar waveguide" (col. 3, lines 20-21). The rejections of claims 8 and 10 are improperly expressed, and no case of obviousness has been established. The undersigned respectfully requests removal of these rejections and allowance of claims 8 and 10.

The Examiner states that Kielmeyer discloses "wherein the component is a second planar transmission line having a second center conductor (44) narrower than the center conductor [claim 19]" (Detailed Action, page 7, lines 5-7). The Applicants traverse and respectfully direct the Examiner's attention to Fig. 1 of Kielmeyer, which clearly shows that the bond pad 44 is not narrower than the center strip 18 of the opposing transmission structure. The Applicants respectfully request reconsideration and allowance of claim 19.

Claim 20 stands rejected as being unpatentable over Kielmeyer in view of Baldonado as applied to claim 17, and further in view of U.S. Patent No. 6,548,893 by Chen ("Chen"). Claim 20, which depends from claim 17, further recites that "the first planar transmission device is a first coplanar stripline transmission structure having a first center conductor and a second center conductor and the component is a second coplanar stripline transmission structure having a third center conductor and fourth center conductor." The Examiner cites Chen for providing multiple microstrip lines in a transmission structure, and asserts that one of ordinary skill in the art would have been motivated "to include a second conductor on the first device and a fourth conductor on the second device in the modified invention of Kielmeyer . . . to allow for the simultaneous transmission of shielded signals." The Applicants traverse.

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The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. As noted by the Examiner, Chen discloses multiple striplines (buried striplines 27, col. 2, line 31). Chen does not disclose or suggest "a first coplanar stripline transmission structure having a first center conductor and a second center conductor and the component is a second coplanar stripline transmission structure having a third center conductor and fourth center conductor." The elements of claim 20 are not found in the cited references.

A suggestion to combine references cannot require substantial reconstruction or redesign of the prior art. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (C.C.P.A. 1959). Modifying the mode converter 33 or the impedance transformer 40 of Kielmeyer to operate with multiple center conductors would require substantial reconstruction and redesign. Burying the coplanar waveguides of Kielmeyer as taught by Chen would require substantial redesign. Modifying Kielmeyer to use the buried striplines of Chen instead of the coplanar transmission structures disclosed therein would require substantial redesign. Since the striplines of Chen are buried, and the coplanar structures of Kielmeyer are not, the Examiner has not provided a convincing line of reasoning as to why the asserted motivation would arise for the coplanar structure of Kielmeyer, even if it were modified as urged. The Examiner has not indicated where the prior art support any reasonable expectation of success for such a modification. There is no suggestion in Kielmeyer that simultaneous transmission of shielded signals through the mode converter 33 or impedance transformer would have been desirable.

The Examiner may not use the Applicant's disclosure as a template to re-construct the rejected claim from selected elements of the prior art (*In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992)). The Examiner appears to have taken a piecemeal approach using the Applicants claim as a template. No *prima facie* case of obviousness has been established for claim 20, and claim 20 is further patentable.

CONCLUSION

The Applicants submit that all claims are now in condition for allowance. Favorable reconsideration and timely issuance of a Notice of Allowance are respectfully requested. Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims, and/or drawings, then it is respectfully asked that

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such changes be made by an examiner's amendment, if the Examiner feels this would facilitate passage of the case to issuance. If the Examiner believes a telephone conference would expedite prosecution of this application, the Examiner is cordially invited to telephone the undersigned at (707) 591-0789.

Respectfully submitted,



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